

APPENDIX F

Utility Consumption Calculations for the Proposed Action

Potable Water, Wastewater, Solid Waste, Electricity, and Natural Gas Calculations for the Proposed Action

	Existing Use per Family Housing Unit	Existing Annual Use by Family Housing (191 Units)	New Annual Use from Addition of 163 New RCI Housing Units	Future Annual Use by Housing Areas Total	Increase in percent consumption from housing areas from installation as a whole
Potable Water (million gallons per year)	0.127	24.3	20.7	45.0	4.8 to 7.8 percent
Wastewater (million gallons per year)	0.094	17.954	15.322	33.276	6.8 to 9.4 percent
Solid Household Waste (cubic yards per year)	13.47	2,573	2,196	4,769	3.0 to 5.0 percent
Electrical (kWh per year)	11,225	2,143,998	1,829,675	3,973,673	1.5 to 2.5 percent
Natural Gas (ccf per year)	255.71	48,840	41,728	90,568	0.9 to 1.3 percent

N/A = not available

Objective: Calculate new utilities consumption from construction of 163 new housing units under RCI**Assumptions:**

- There are 191 existing housing units. The number of family housing units end state will be 354 units, a net increase of 163 units.
- Existing use per housing unit for potable water, solid waste, electricity, and natural gas obtained from the *Environmental Assessment for the Construction and Operation of Family Housing Quarters at Fort Detrick, Maryland* (USAG Fort Detrick, 2002c).
- Generation of wastewater per housing unit obtained from the *Environmental Assessment Installation Master Plan for Fort Detrick, Maryland* (USAG Fort Detrick, 2003b).
- Baseline and projected future consumption of potable water, electricity, solid waste, and natural gas for the installation as a whole obtained from the *Environmental Assessment: Installation Master Plan for Fort Detrick, Maryland* (USAG Fort Detrick, 2003b).

Potable Water:

Baseline installation water consumption:	511 million gallons per year
Baseline housing water consumption:	24.3 million gallons per year
Percent of installation water consumed by family households:	$24.3/511 = 4.8$ percent
Number of Housing in 2001:	191 housing units
Gallons of water used per housing unit in FY 2001:	$24.3/191 = 0.127$ million gallons per year
Number of additional new housing units under RCI:	163 housing units
Annual use from additional 163 units:	$163 * 0.127 = 20.7$ million gallons per year
Future annual use from total 354 housing units:	$24.3 + 20.7 = 45$ million gallons per year
Projected future installation consumption:	575.2 million gallons per year
Projected percent of installation water consumed by family households:	$45/575.2 = 7.8$ percent

Wastewater:

Annual gallons of wastewater generated by the installation:	262,714,000 gallons per year
Estimated gallons per year of wastewater generated by a single family housing unit:	94,000 gallons per year per house
Estimated wastewater generated in a year by all existing family housing units:	94,000 gal*191 houses=17,954,000
Percent of installation wastewater generated by family households:	17,954,000/262,714,000=6.8 percent
Number of additional new housing units under RCI:	163 housing units
Annual wastewater generated from additional 163 units:	163*94,000= 15,322,000 gallons
Future annual waste generated from total 354 housing units:	17,954,000 + 15,322,000=33,276,000 gallons per year
Projected future installation wastewater generation:	352,393,232 gallons per year
Projected percent of installation wastewater generated by family households:	33,276,000/352,393,232=9.4 percent

Solid Household Waste:

Cubic yards of waste generated in FY2002 by the installation:	86,880 cubic yards
Cubic yards of waste generated by family households in September 2001:	174 cubic yards in the month
Estimated cubic yards generated by family households in a year:	174 cubic yards*12 months=2,088 cubic yards per year
Number of housing units in 2001:	155 housing units
Annual cubic yards solid waste generated per housing unit in 2001:	2,088/155=13.47 cubic yards per house per year
Estimated cubic yards of waste generated by family households in 2003:	13.47 cubic yards*191 housing units = 2,573 cubic yards
Percent of installation waste generated by family households in a year:	2,573 cubic yards /86,880 cubic yards = 3.0 percent
Number of additional new housing units under RCI and MCA:	163 units
Annual waste generated from additional 163 units:	163*13.47 cubic yards= 2,196 cubic yards per year
Future annual waste generated from total 354 housing units:	2,573 cubic yards + 2,196 cubic yards=4,769 cubic yards per year
Projected future installation consumption:	95,046 cubic yards per year
Projected percent of installation solid waste generated by family households:	4,769/95,046=5.0 percent

Electrical:

Baseline installation electricity consumption:	139,323,476 kWh per year
Total electrical consumption for households in 2001:	2,143,998 kWh per year
Percent of installation electricity consumed by family households:	2,143,998 kWh/139,323,476 kWh = 1.5 percent
Number of housing units in 2001:	191 housing units
Annual electrical consumption per housing unit in 2001:	2,143,998/191 = 11,225.12 kWh per house per year
Annual use from additional 163 units:	163*11,225 = 1,829,675 kWh per year
Future annual use from total 354 housing units:	2,143,998 kWh + 1,829,675 kWh = 3,973,673 kWh per year
Projected future installation consumption:	160,473,592 kWh per year
Projected percent of installation electricity consumed by family households:	3,973,673/160,473,592 =2.5 percent

Natural Gas:

Baseline installation natural gas consumption:	5,655,120 hundreds of cubic feet (ccf) per year
Natural gas consumption per month by housing in 2001:	4,070 ccf per month
Estimated natural gas consumption per year by family housing in 2001:	$4,070 * 12 = 48,840$ ccf per year
Percent of installation natural gas consumed by family households:	$48,840 \text{ ccf} / 5,655,120 \text{ ccf} = 0.9$ percent
Number of households in 2001:	191 housing units
Natural gas consumption per household per year in 2001:	$48,840 / 191 = 255.71$ ccf per house per year
Annual use from additional 163 units:	$163 * 256 \text{ ccf} = 41,728$ ccf per year
Future annual use from total 354 housing units:	$48,840 \text{ ccf} + 41,728 \text{ ccf} = 90,568$ ccf per year
Projected future installation consumption:	6,828,593 ccf year
Projected percent of installation electricity consumed by family households:	$90,568 / 6,828,593 = 1.3$ percent